PHASE 2 REVIEW: San Francisco Area Network

Reviewer: John Gross Date: October 2003

Documents(s) reviewed:

i. Regional requirements: Were the following formatting guidelines used?
Page numbers
Header or footer with the document name, main author, date
Line numbers
Yes.

Section I. Report Format, Logical Organization, Writing

1. Does the Format and Outline correspond to the guidance in "Outline for Vital Signs Monitoring Plan"?

- Are the chapter headings the same as identified on pages 2-5? Is there an Executive Summary or is one planned?

Headings are the same as in the TOC. The Excutive summary still needs to be completed.

- Organization of Content (Document): Are there Tables of Contents (TOC) for the document, figures, and tables? Are the section headings the same as in the TOC? How well do they describe the content of the section?

The document is very well organized and headings, appendices, figures, and tables are included in the appropriate TOCs.

- Length and Appendices: Is this portion of the monitoring plan concise enough that it will be reasonable for the completed main document to be around 100 pages in length (including later chapters of the monitoring plan)? If more detailed sections of the plan are available in Appendices, on the web, or in some other document, is it clear how they relate to the main document? Is there a consistent format and organization for the Appendices? Do you have any suggestions for improving the format and organization of the Appendices?

The length is and appendices are good. The document is concise and reads well.

2. Organization of Information. Please comment on the organizational structure and flow of information. Is the current organization logical? How could it be improved?

The flow is excellent.

- Synthesis, Organization and Presentation of Information: Do the authors make good use of tables, figures, captions, and other methods of organizing information concisely? Please comment on the usefulness and relevancy of figures and tables.

Figures and tables are used effectively throughout the document.

3. Clarity, Style, and Content: Is the document clearly written and the style appropriate for a technical document that will be read by experts interested in the ecological and statistical design of the monitoring plan, and by an educated audience that may not be as knowledgeable about these topics, but is concerned about their management implications? Is the document well-written with good attention to specifics and few typographical errors? Are acronyms over-used? Are they defined? Please comment on other items related to writing style that were noted in the document.

This is an unusually well-written report.

4. Other Comments.

Section II. Chapter 1 - Introduction and Background

1. How well have the authors answered the question, "Who is interested in monitoring information and why?"

- How well is the purpose of the monitoring program explained?

There is a clear and thorough description of the purpose of the monitoring program.

- Does the summary of NPS policy, guidance, and other federal legislation preceding the formalization of the NPS Inventory and Monitoring Program convey the importance and force of legislative mandate regarding the need to monitor NPS natural resources? Does it appear comprehensive and complete?

Yes – follows the recommended template. The url on page 11 (Section 1.1.2) should be updated to (http://science.nature.nps.gov/im/monitor/LawsPolicy.htm).

- Are both Servicewide and network-specific goals for monitoring identified and differentiated? Are they clearly stated? How well will they serve to guide the network in developing a high-quality, long-term monitoring program?

Yes – monitoring goals are clearly stated.

- Are the relevant Servicewide and park-specific strategic goals for performance management (GPRA) stated, in addition to any statements from park enabling legislation that establish the need to monitor natural resources?

Yes – Table 1.1. is an excellent good summary of GPRA goals and the parks where they apply.

2. Ecological Context: Is an overview of important natural resources in each park discussed? Is the summary presented in a way that suggests the integration of the parks into a network? (Greater detail could be present in an appendix. The information presented here would be a synthesis of the expanded information available in the appendix.) How well does the overview represent the expanded material in the appendices?

- How well are the important ecological and management issues in each park described, including T&E, sensitive, and special status species?

Tables 1.11, 1.12 and the associated text provide an excellent summary of major management issues, and the relation between management issues and potential questions that monitoring might address. To ensure that expectations are not unrealistically high, it would be useful to evaluate each sample question in Table 1.12 against the likelihood that the monitoring program will actually address the question in a meaningful way. It's not likely that monitoring will answer very many "why" questions – these typically require significant research. Monitoring is more likely to address questions such as "how much has ___ changed over time" or "what is the state of ____". This suggestion applies to questions (in Table 1.12) associated with air quality, human population increase, land use, resource extraction, etc. We can probably measure a change in state (e.g., declining fish population or change in a vegetation community), but in most cases further research will be necessary to unambiguously link a detectable change to a specific driver or event.

- How well has the importance of the park's natural resources been discussed in a regional or national context?

There's a good discussion of regional biomes, and of local to regional issues such as water quality, and a very comprehensive list of species of special concern.

- Water quality: Are parks identified that have waters where constituents exceed water quality standards and are listed on state Clean Water Act 303d lists or where water bodies are in danger of becoming degraded? Are parks with waters designated as Outstanding National Resource Waters or with other special protective designations identified? Are water quality monitoring parameters and management thresholds discussed here or in another section? Please comment on the organization and content of this section. Is anything missing?

The report lists all waters on the 303d list and the Areas of Special Biological Significance. There are no ONRW waters in the network parks.

- Is there an overview of the current and past natural resource monitoring being done in each park? Any widely-accepted monitoring efforts used on adjacent lands by other agencies or any current cooperative monitoring efforts should also be described. Is the description detailed enough to tell the significance of other monitoring activities to NPS efforts?

Table 1.13 and Appendix 8 provide information on past and present monitoring efforts in parks. Appendices 8 and 9 address monitoring outside parks, and they are a very good start but are not yet completed. Some additional work is needed to fully evaluate how or if monitoring efforts outside and/or adjacent to Parks and can contribute to SFAN.

3. Was the overall process that was used to determine monitoring goals and objectives and to initially select Vital Signs for monitoring park resources clearly described? If so, does this process appear to be unbiased and reasonable, and to have resulted in a representative list of important ecological indicators for the network parks?

The process was described well, but my concerns are expressed in more detail below.

- Are the workshop reports included and is the workshop process clearly described?

Reports from workshops were included as appendices. These proceedings form part of the administrative record. They should not be included in the Phase III report (e.g., the Network needs to keep a copy, but they are more likely to confuse people at later stages).

4. Other comments for Chapter 1:

Chapter 1 is an excellent overview of the program.

Section III. Chapter 2 – Conceptual Models

1. In this section, networks are supposed to provide a tabular, graphical, and/or narrative summary describing the important components of network and park ecosystems such as ecosystem drivers, stressors, structures, processes, and indicators of change and the interactions among them. Please comment on how well these goals were achieved. Are the conceptual models developed logical and relevant, and are the relationships explained clearly? Does the model enhance understanding of the important factors influencing the structure and function of the ecosystem? How are different scales and spatial dynamics addressed? What other comments do you have? What did the network do "right"?

see below

2. How well are the basic purposes and types of conceptual models defined? Does the author provide an explanation for selecting this particular approach to model development? (Some other types of conceptual models could include process models, structural models, population models, models built around focal or keystone species, etc. in addition to the stressor-based models.)

see below

3. Are monitoring questions or vital signs for the network and network parks identified? Is their relationship to the conceptual model clear?

See below

- Are terms and concepts clearly defined?

3. Other comments for Chapter 2:

Chapter 2 needs an additional diagram right at the beginning that illustrates the drivers and stressors that are described. I.e., something that more explicitly informs the reader where the chapter is going.

I didn't find the conceptual models to be particularly insightful or informative, but the ultimate measure is whether they served their purpose to communicate links between drivers, ecosystem processes, and to identify potential vital signs. I prefer a hierarchial set of models (consist with the concept presented early in Chapter 2) as a framework. As presented, I had trouble finding connections between the general model (Fig. 2.2) and the 3 ecosystem models. The ecosystem models didn't clearly communicate which interactions were most important, and the information in many boxes was redundant. Thus the diagrams have far less content than first appearances would suggest. I think a set of rather general models would provide a useful framework for identifying whether the set of vital signs adequately covers the range of ecosystem functions, and it will be crucial to interpreting monitoring results over time.

Tables 2.1a-e didn't help me much, as some of the connections were not obvious to me (e.g., solar/lunar cycles and species at risk) while other obvious relationships were not identified as important (e.g., climate change and community area and distribution). These tables would profit from detailed narratives that cite studies specific to the study area. As protocols are developed, presumably more detailed models (e.g., consistent with sec. 2.9) will be developed, and it will be necessary to include the detailed narrative with the detailed models.

There are a variety of possible approaches for developing and refining the conceptual models. Relevant materials and examples are posted on the I&M web site (http://science.nature.nps.gov/im/monitor/Conceptual_models.htm) and several networks have well documented examples (e.g. NCPN, SCPN, GRYN, NCBN; I'm sure there are others that I haven't yet seen). Model development seems to go most smoothly when 1 or 2 people take the lead for a particular model (e.g., coast, temperate forest, grassland) and their work is then reviewed by others. It is extremely difficult to create a conceptual model in a workshop setting.

Section IV. Chapter 3 – Vital Signs

1. How well is the need for prioritization of vital signs discussed? For the network? For parks? Is the relationship between park and network vital signs described?

The need to set priorities is clear, but the distinction between park and network vital signs was not clear to me. I didn't find any discussion of the relationship between park and network vital signs.

2. Are vital signs selected for monitoring listed together with the justification for why they were selected, and a description of how they fit into the conceptual model? Does the line of reasoning make sense?

Chapter 3 contains little justification for selected vital signs, presumably because the material in Chapter 2 is supposed to explain the necessary relationships. However, in most cases proposed vital signs were only linked to an ecological process in the most general sense in Chapter 2. Thus the specific rationale for many the vital signs was unclear. The conceptual models in Chapter 2 are too general to illustrate meaningful relationships between a proposed VS and an ecological process.

3. Are the criteria used to determine which components would be included in the monitoring program identified and adequately explained for all relevant portions of the process? Is it clear how tie scores were resolved?

The criteria and process were well described, and Chapter 3 includes a discussion on the processes used to move from the preliminary to final list.

4. How well is the process used to prioritize and select vital signs described? Are results of the scoping and prioritization workshops and other efforts to identify the most important issues and data needs for parks in the network described?

The report includes good descriptions of the efforts to prioritize vital signs.

5. Realizing that most networks are not yet in the protocol development phase, has the network prepared for the next phase of protocol development by suggesting specific measurable attributes that it is considering evaluating for monitoring of each vital sign. Is there an adequate discussion of this topic?

Table 3.3 includes a column indicating the current status of protocol development. However, some of the proposed vital signs are so general that much work remains to determine what will be measured, how to measure it, and where and when to measure it. Much more work will be needed to figure out, for example, how to measure "plant community change at multiple scales" and many other indicator in Table 3.3. A set of well structured conceptual models would greatly assist this process by providing an overarching conceptual framework and illustrating mechanistic linkages. It is very important to consider system interactions when making decisions on what to measure, what units to use, when, where, and how often to make the measurement. The models will help SFAN staff determine whether they have adequately included basic measures, how (or whether) the suite of vital signs forms a integrative suite of indicators, and whether each proposed vital signs add sufficient value by providing information not obtainable from other vital signs.

I found it helpful to present the set of vital signs in a variety of formats to help communicate the breadth and depth of the proposed set of vital signs. The GRYN and NCPN reports include good examples of alternative table structures. Table 3.4 is a good start, but other "views" of the list are needed – one should be organized around your major ecosystems.

6. For water quality monitoring, have pollutants that exceed water quality standards been identified along with their threshold contamination values? Have other water quality indicators been identified and quantitatively discussed?

Sections 1.3.2.2 and 3.4 discuss water quality issues and present quantitative objectives.

7. Other comments for Chapter 3:

The generality of the conceptual models makes it difficult to evaluate whether the suite of proposed vital signs is consistent and integrative across the major ecosystems. This is discussed in Appendix 10, but the analyses only evaluate what was selected – this is not an effective way to identify gaps.

Section V. Synthesis Comments

1. Does the monitoring plan to-date provide a sound foundation for a scientifically credible monitoring program that will ultimately meet the most important information needs of the parks in the network? Why or why not?

The report includes an excellent discussion of the major threats and issues facing Parks in the SFAN. Phase III activities should include more detailed models that illustrate more direct connections between selected vital signs, and these models must be accompanied by scholarly literature reviews that apply specific to the study areas. The material in the report is exceptionally well written and organized and it provides and excellent foundation which the program can build on.

2. Please list the areas of the monitoring plan that, in your opinion, are in the greatest need of additional work before the network moves into the next phase of sampling and protocol development?

The conceptual models need more work. The program should consider developing an overarching conceptual framework that holds the pieces together and shows how the vital signs are related to significant ecological processes and management objectives.

3. Additional Comments.

This report demonstrates a great effort made since the last report was submitted. The report was nicely produced, well organized, and the quality of the writing was very high.